

B10E

Power Supply Unit

User's Manual



Megger

WWW.MEGGER.COM

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1 General

1.1 Introduction

Power Supply Unit B10E is used to supply voltage to the Circuit Breaker (CB) coils and spring-charging motor during installation and/or field service.

Since the high-quality voltage available at the coil outputs is very load-independent, the power supplied resembles what is encountered under normal operating conditions. Circuit breaker functionality thus remains virtually unchanged.

B10E enables you to test CB functions easily at the specified voltage levels.

1.2 Service and support

For technical assistance please contact your local Megger representative or direct your request to the office in Sweden.

Contact Information

Internet: www.megger.com
E-mail: support-sweden@megger.com
Tel: +46 8 510 195 00

Checklist before calling/e-mailing for support

- Read the manual
- Restart the instrument(-s), redo test connections and try again
- Try to repeat the failing operation if possible
- Identify the instrument model and serial number.

Shipping

If you are going to send the instrument with parcel service use the original transport box or one with equivalent strength. Megger can not take responsibility for transport damages.

2 Safety

2.1 General

- Always follow the local safety regulations that apply to work with high-voltage equipment.
- Read and comply with the following safety instructions.

Symbols on the instrument



Caution, refer to accompanying documents.



Protective conductor terminal.



WEEE, Waste Electrical and Electronic Equipment. Please utilize your local WEEE collection facilities in the disposition of this product and otherwise observe all applicable requirements. The unit can also be returned to Megger at any time at no charge for the disposal.

2.2 Safety instructions



WARNING

- 1 Always make certain that the DC system in the substation is disconnected before connecting B10E.
- 2 Always ground the B10E.
- 3 Before connecting B10E, turn off its master ON/OFF switch.
- 4 Only connect B10E to an outlet protected with max 16 A overcurrent protection
- 5 High voltage/current on input/output terminals.
- 6 Do not attempt to service the instrument yourself. Opening or removing covers may expose you to dangerous voltage. If you attempt to service the instrument yourself the warranty is no longer valid.
- 7 Do not use any accessories that are not intended for use together with the instrument.
- 8 Disconnect the instrument from the mains before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.

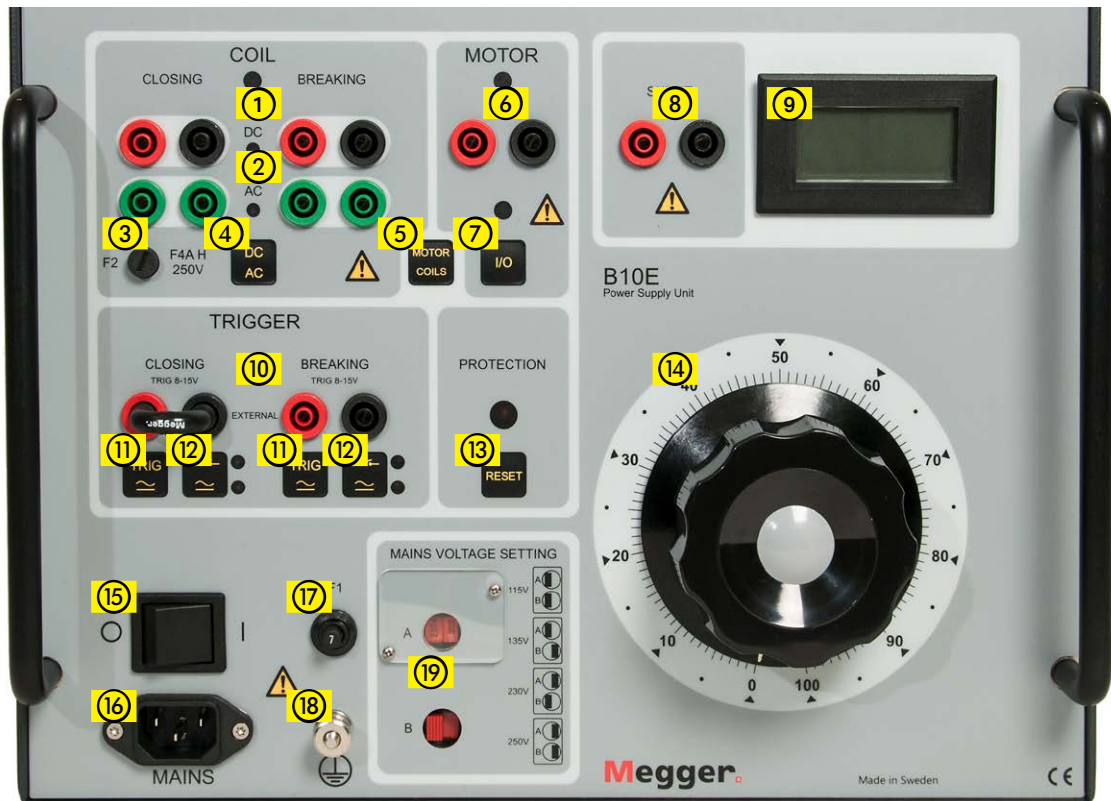
**IMPORTANT**

- 1** Always use safety connecting leads.
- 2** Never leave the instrument unattended while it is turned on.
- 3** Use only approved mains detachable cable set with the instrument. Main supply cables shall be rated for the maximum current for the equipment and the cable shall meet the requirements of IEC 60227 or IEC 60245. Mains supply cables certified or approved by a recognized testing authority are regarded as meeting this requirement.
- 4** Unplug the instrument from the mains supply when it is left unattended or not in use.
- 5** Refer all servicing to Megger authorized personnel.
- 6** If you need to return the instrument, please use either the original crate or one of equivalent strength

3 Control panel

1	Output for DC voltage supplied to closing/ breaking coil
2	Output for AC voltage supplied to closing/ breaking coil
3	F2. 4 A fuse for AC outputs
4	Changeover switch used to select either DC or AC coil outputs
5	Changeover switch used to select either coil outputs or spring-charging motor outputs
6	DC voltage outputs for spring-charging motor. Provide unsmoothed, half-wave rectified DC ranging up to 18 A
7	Button for turning on spring-charging motor voltage
8	Current shunt output used to measure current, in coils or spring-charging motors (max 5 A continuous)
9	Voltmeter

10	Input for external trig signal or short-circuiting jumper
11	Button for manual triggering pulse via coil out- puts. (Switch 12 set to voltage position)
12	Changeover switch used to select either con- tact sensing or voltage sensing at the trig input
13	Reset button for thermal, overload and/or time- limit cut-outs
14	Variable transformer
15	Master ON/OFF switch
16	Inlet for mains power
17	F1. 7 A miniature circuit breaker for DC spring- charging motor
18	Grounding terminal
19	Changeover switches (A) and (B) for incoming power 115/230/135/250 V AC



4 Operating instructions

4.1 Circuit breaker triggering



Important

Read the manual and comply with the Safety instructions before using B10E. Always comply with local safety regulations.

When the master ON/OFF switch on B10E is turned on, you are ready to proceed with testing. As a rule, output is set for the coil outputs before B10E is started. Moreover, the coil outputs are usually set for DC and the trig input is set for voltage sensing.



Warning

If the coil current is below 50 mA the 1 sec automatic interruption will not work. A potential hazard for burning the trip coil.

Note *The COIL DC and AC outputs, CLOSING/BREAKING, cannot be used simultaneously. A time limit is imposed on the DC outputs. If the DC outputs are loaded with minimum 50 mA, the current will be interrupted after about one second to protect the automatic control circuitry. The AC outputs can be loaded for up to 30 minutes at maximum specified power.*

- 1] Ground B10E.
- 2] Switch off the master ON/OFF switch.
- 3] Check that the substation voltage is disconnected from the circuits in which B10E is to be connected.
- 4] Turn the variable transformer to zero.
- 5] Make connections to the CB operating circuits.
- 6] Connect B10E to the mains power.
- 7] Switch on B10E.

Note *The current inrush on starting is high and can trip/blow a 10 A fuse.*

- 8] Select the desired trig function and output. You can select either manual or external triggering via the coil outputs. For manual trig, set the trig input to voltage

sensing.

For external triggering, you can select either zero-potential contact sensing or 8–15 V voltage sensing. Since B10E is usually used together with a circuit breaker analyzer, external contact sensing is normally selected and the trip input is normally provided with a short-circuiting jumper

- 9] Set the voltage to desired level using the variable transformer.
- 10] Operate the CB.

Note *If any of the protective cut-outs on B10E trip, a lamp marked PROTECTION will light up.*

Reset by pressing the RESET button. However, you must wait a while before the thermal cut-out can be reset.

Application examples

Manual triggering of CB

- 1] Make certain that the mains are de-energized on both sides of the CB, and then ground the CB on both sides.
- 2] Ground B10E.
- 3] Set the master ON/OFF switch on B10E to the OFF position.
- 4] Connect the CB coil circuits to B10E, CLOSING/BREAKING. Use the appropriate outputs DC or AC. Connect the CB spring-charging motor to B10E, MOTOR.
- 5] Connect B10E to the mains power.
- 6] Switch on the B10E master ON/OFF switch.
- 7] Check that B10E is set for the coil outputs, and for the correct type of voltage, DC or AC.
- 8] Set the desired output voltage.
- 9] Select voltage sensing for the trig input.
- 10] Press the TRIG button (8) to start the desired operation.

B10E together with a circuit breaker analyzer

- 1] Make certain that the mains are de-energized on both sides of the CB, and then ground the CB on both sides.
- 2] Ground B10E.
- 3] Set the B10E master ON/OFF switch to the OFF position.
- 4] If the CB has a common negative terminal, connect the positive side of CB operating mechanism's close and open circuits to the circuit breaker analyzer outputs marked CLOSE and OPEN. Connect the spring-charging motor's positive and negative terminals to the MOTOR outputs on B10E. Then connect one of B10E's COIL outputs, DC or AC, to the negative input to the circuit breaker analyzer (marked INPUT).
- 5] Connect B10E to the mains power.
- 6] Switch on the B10E master ON/OFF switch.
- 7] Check that B10E is set for the coil outputs and for DC.
- 8] Select contact sensing for the trig input.
- 9] Check that the trig input is short-circuited.
- 10] Select the desired operation on the circuit breaker analyzer's sequencing unit and operate the CB from the circuit breaker analyzer.

4.2 Troubleshooting

Fault	Cause
B10E does not start	Master ON/OFF switch is at OFF position
No output voltage from B10E	Miniature circuit breaker has tripped or fuse has blown
Impossible to trip CB via the DC coil	Contact-sensing changeover switch is at wrong position
Impossible to load the AC outputs	Glass-tube fuse F2 has blown
Impossible to load the DC outputs	Miniature circuit breaker F1 has tripped
No DC voltage at spring-charging motor outputs	Motor/Coils changeover switch is at wrong position
	Voltage not supplied to spring-charging motor
	AC/DC changeover switch is at wrong position

5 Specifications

SPECIFICATIONS B10E

Specifications are valid at nominal input voltage and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

Environment

Application field The instrument is intended for use in medium and high-voltage substations and industrial environments.

Temperature

Operating 0°C to +50°C (32°F to +122°F)
Storage & transport -40°C to +70°C (-40°F to +158°F)

Humidity 5% – 95% RH, non-condensing

CE-marking

LVD 2014/35/EU
EMC 2014/30/EU
RoHS 2011/65/EU

General

Mains voltage 115/230 (135/250) V AC, 50/60 Hz
Power consumption 3300 W (max)
Protection Thermal cut-outs, +80°C (+176°F)
 Short-circuit protectors at DC outputs

Dimensions

Instrument 350 x 270 x 220 mm
 (13.8" x 10.6" x 8.7")
Transport case 610 x 290 x 360 mm
 (24.0" x 11.4" x 14.2")

Weight 20.8 kg (45.8 lbs)
 29.3 kg (64.6 lbs) with accessories and transport case

Test lead set, with 4 mm stackable safety plugs 2 x 0.25 m (0.8 ft), 2.5 mm²
 2 x 0.5 m (1.6 ft), 2.5 mm²
 8 x 2 m (6.6 ft), 2.5 mm²

Display LCD

Measurement section

Voltmeter – digital

Range 0 – 300 V DC, 0 – 300 V AC
Resolution 1 V
Inaccuracy ±1% of displayed value, DC
 ±2.5% of displayed value, AC
Current shunt 5 A/50 mV ±0.5% (built-in)

Outputs (DC), CATII

COIL, CLOSING/BREAKING

Output voltage 24-300 V DC
Load interval Max 1 s (at currents over 50 mA)
Ripple 2% peak-to-peak of the preset voltage

No-load voltage (V)	Current (A)	Load dependency
24	10	< 6 %
48	10	< 3 %
110	6.5	< 2 %
250	3	< 2 %
300	1.25	< 2 %

Outputs (AC), CATII

COIL, CLOSING/BREAKING

Output voltage 24-260 V AC
Load current Max 5 A
Load interval Max 30 min

Output DC, CATII MOTOR

Open circuit voltage (V)	Current (A)	24-300 V DC (loaded)	
		Load voltage (V)	Max load interval (s)
44	18	24	20
48	12	40	60
48	18	30	20
120	12	90	60
120	18	70	20
240	6	200	60
240	9	185	20

Max voltage: Terminals to protective earth (ground)

Terminal	Voltage
Coil closing	300 V DC, 260 V AC
Coil breaking	300 V DC, 260 V AC
Motor	250 V AC
Shunt	250 V AC
Trigger closing	8 – 15 V AC
Trigger breaking	8 – 15 V AC

Your "One Stop" Source for all your electrical test equipment needs

- Battery Test Equipment
- Cable Fault Locating Equipment
- Circuit Breaker Test Equipment
- Data Communications Test Equipment
- Fiber Optic Test Equipment
- Ground Resistance Test Equipment
- Insulation Power Factor (C&DF) Test Equipment
- Insulation Resistance Test Equipment
- Line Testing Equipment
- Low Resistance Ohmmeters
- Motor & Phase Rotation Test Equipment
- Multimeters
- Oil Test Equipment
- Portable Appliance & Tool Testers
- Power Quality Instruments
- Recloser Test Equipment
- Relay Test Equipment
- T1 Network Test Equipment
- Tachometers & Speed Measuring Instruments
- TDR Test Equipment
- Transformer Test Equipment
- Transmission Impairment Test Equipment
- Watthour Meter Test Equipment
- STATES® Terminal Blocks & Test Switches
- Professional Hands-On Technical and Safety Training Programs

Megger is a leading global manufacturer and supplier of test and measurement instruments used within the electric power, building wiring and telecommunication industries.

With research, engineering and manufacturing facilities in the USA, UK, Germany and Sweden, combined with sales and technical support in most countries, Megger is uniquely placed to meet the needs of its customers worldwide.

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